Remarks on the "Manna" or Lerp Insect of South Australia.

By J. G. Otto Tepper, F.L.S.

[Read February 15, 1883.]

The natural production of Australia known by the various cognomens of "Manna" by the colonists, "Lerp" by the natives of Victoria &c., and "Melitose" by others has excited frequently the inquiries of those who met with it.

Mr. George Bennett, in his work 'Gatherings of a Naturalist in Australia,' 1860, p. 272, says that the natives ascribe it to the *Tettigonia*; but adds that "it has been ascertained to be secreted by an insect of the genus *Psylla*," in which he most likely comes very near the truth.

Prof. Fred. M'Coy, describing the Great Black or Manna Cicada (*Cicada mœrens*, Germ.), in the fifth Decade of his 'Natural History of Victoria,' says (p. 55):—"This large species of *Cicada* piercing the young twigs of the Peppermint Gum-tree [of Victoria, O. T.], *Eucalyptus viminalis*, causes an abundant exudation of sap, which, drying in the hot parched air of the midsummer, leaves the sugary solid remains in a gradually increasing lump, which ultimately falls off, covering the ground with a sort of white sweet manna in little irregular masses. This peculiar kind of manna is the 'Melitose' of chemists." He gives thereby expression to the current belief in the Australian provinces, but which my observations, extending over twenty years, lead me to consider as not founded on facts in so far as this province (South Australia) is concerned.

I may mention that there are at least two different kinds of manna, if not more. The kind referred to by Mr. Bennett is entirely different in form and consistency from that referred to by Prof. M'Coy. One occurs in a solid form around the branches or on the leaves of Eucalypts, as *Eucalyptus oleosa* and *E. odorata*. The other originally exists as a moderately viscid fluid under the thin pieces of bark, peeling off, but held by their extremities, or through the insufficient slit of their converging edges, for some time to the branchlet. That *Cicadæ* produce and eject to considerable distances a viscid transparent fluid is certainly the case, as it is often proved, to the annoyance of parties who wish to enjoy their lunch in the shade of such trees the *Cicadæ* inhabit in number, as on the western slopes of the ranges near

Adelaide, the parklands of the city, &c. One finds the dead leaves, grass, &c. frequently quite coated with it; but I have hitherto failed to notice that this ejected substance is of special attraction for the ants, though very numerously present; and therefore it can scarcely be sweet. I have, besides, found it very abundant in localities where ants were very scarce, and occurring in others where I failed to find a single one.

When examining a piece of bark fresh from the tree to which some of the "melitose" is adhering, one finds the clear fluid always surrounded and frequently overspread, wholly or partially, by a fine white flocculent substance without taste, which, to a considerable extent, prevents flow of the liquid part unless when it augments to an undue degree from several closely adjoining sources. When this takes place, large round drops descend and alight upon the dry leaves, loose bark, grass, &c. scattered thickly under the tree; and on a cold fresh morning the drops are found in a more or less solid state. I have never seen this kind solid during the hot part of the day in any locality examined (Mt. Gambier, County Adelaide, Barossa Light, Fergusson), though that does not prove that the melitose of a different species of insect, and in other parts of Australia, does not solidify by heat.

On a piece of bark freshly taken from the tree a close examination shows that the fluffy white substance is thickest in the centre of a ring or oval-shaped deposit of melitose, and forms a complete or partial obstacle to any thing alive that would attempt to enter it. Carefully brushing the fluff away, a small compressed larva of an insect, evidently of very sluggish habits, is seen; and this, I have no doubt, is the real producer of the "manna." None occur where the manna is absent; and the insect is never found without at least an unmistakable trace of the melitose. Of late years both the substance and the insect appear to have become very scarce in such localities as I have examined; and therefore I have not been able satisfactorily to fix its imago; but I believe it to be a small greenish *Psylla* or related genus.

During 1879 Baron F. von Mueller requested me to turn my attention to the "Lerp" insect which chiefly produces the *solid* "manna" accumulating around the branches of Eucalypts in white scales. Acting upon his suggestion, I found the species inhabiting stunted and dwarfed shrubs of *Eucalyptus oleosa* in all its stages. Specimens were forwarded to Baron von

Mueller; but unfortunately they arrived in a state unfit for identification.

Eucalyptus oleosa is a species with an underground rootstock, from which numerous small stems, generally crooked and semi-sarmentose, spring. When these are destroyed by fire &c., a host of fresh ones spring up from the caudex; and on these, not the branches of normal and mature stems, the Lerp insect produces the manna. It consists of circular or broadly oval disks about $\frac{1}{12}$ inch diameter, convex above and concave below, formed of small irregular globules of solid melitose agglutinated, and therefore exhibiting a rough exterior surface. They are crowded around the branchlets, frequently for a length of 6 to 10 inches, and appear first as small specks in December or January. Under each is found a small larva, its short proboscis buried in the bark, and thus fixed to the spot for the period. The imago is very nimble, only about two thirds of a line in length, including its long transparent wings. Copulation takes place almost immediately after emergence.

There is found occasionally a kind of melitose on the leaves of *Eucalyptus gracilis* (solitarily), but more frequently on those of low bushes of *E. leucoxylum* in varying numbers, and in the form of extremely regular, thin scales formed of radiating curved rods united longitudinally, and resembling the half of a minute bivalve shell. These are much larger than the one described; but the species has not been sufficiently observed to do more than to mention its existence.

Addendum.—Since the preceding paper was read and in type the author has forwarded a letter, of which the following is a summary of the contents:—

Referring to my communication on the Lerp insect, Baron von Mueller has lately kindly sent me the Proc. Roy. Soc. Van Diemen's Land, vol. i. (1851), which contains (p. 235) a paper on the subject by Mr. Thos. Dobson, and another (*l. c.* p. 241) on the Chemical Constitution of the Manna by Dr. Thos. Anderson. I believe, however, that neither of the Lerp insects therein described are identical with that observed by myself, though one of them may be closely related to that producing the larger symmetrical shields on leaves as noted by me. The pupa-case figured by Dobson appears quite correct, as I have seen somewhat similar perfect insects emerge from cases not unlike his. I myself have examined with a pocket-lens branchlets covered by insects in all stages; but later in the season one finds nothing but empty cases. I also am of opinion that the solid and the fluid melitose are of quite distinct origin, the latter being due to the larva previously mentioned; but the former is of more doubtful origin. It certainly is not produced by the *Cicada viminalis*, nor is it confined to *Eucalyptus viminalis*, though most abundant on that tree. It does not occur every year, nor always where the tree abounds.

[Reference may here be given to a paper on the Lerp's constructions by Mr. W. H. Wooster, Journ. Micros. Soc. Victoria, vol. i. p. 91, pl. vii. (1882).]